

CHAPTER 6

RICE EQUIPMENT

1. INTRODUCTION	Page 6-1
2. TOLERANCES	Page 6-1
3. DOCKAGE TESTERS	Page 6-2
4. RICE SHELLERS	Page 6-4
5. RICE MILLERS	Page 6-17
6. TESTING	Page 6-21
INSTRUCTIONS FOR COMPLETING FORM FGIS-925, "RICE CHECKTEST FORM"	Page 6-31
McGILL NO. 3 RICE MILLER - PARTS LIST	Page 6-34

CHAPTER 6

RICE EQUIPMENT

1. INTRODUCTION

The inspection of rough rice requires the use of a dockage tester, rice sheller, and rice miller. To inspect brown rice for processing only a rice miller is required. For official purposes, only use dockage testers, rice shellers, and rice millers that are: (1) types and models approved by FGIS; (2) maintained in good operating condition; (3) properly adjusted; and (4) tested and examined at the prescribed intervals, in the prescribed manner, and found to be within tolerance.

2. TOLERANCES

<i>Rough Rice</i>		
Dockage Tester	Total Dockage	± 0.50 percent ¹
Rice Sheller	Paddy Rice	± 3.0 percent
	Broken Kernels	± 3.0 percent
	Weight to Miller	± 1.0 percent
Rice Miller	Whole Kernels	± 2.0 percent
	Total Rice	± 1.5 percent

<i>Brown Rice for Processing</i>		
Rice Miller	Whole Kernels	± 1.5 percent
	Total Rice	± 1.0 percent

¹All tolerances are mean deviation from standard.

3. DOCKAGE TESTERS

a. Maintenance and Alignment.

(1) General.

- (a) Maintain dockage testers in good operating condition. Check and align them prior to initial use and periodically thereafter, as needed.
- (b) Dockage testers used for rough rice inspections are identical to those used to inspect grain, except rice dockage testers are equipped with a special feed control assembly. See Chapter 4, "Dockage Testers," for general guidelines about installing, maintaining, aligning, and adjusting the dockage tester.

(2) Special Feed Control Assembly.

- (a) The special feed control assembly consists of an adjustable, flow-retarding plate that is mounted vertically in the feed hopper and a cog wheel assembly that is used to vibrate the hopper feed valve. The purpose of the retarding plate is to restrict the flow of rough rice to the feed roll, thereby preventing an uneven feed through the aspirator assembly.
- (b) When using the dockage tester for rice, the feed is controlled solely by the control knob on the special feed control assembly. Set the machine feed control, on the outside of the dockage tester, to the maximum open position.

b. Dockage Tester Adjustments. After the maintenance and alignment checks on a new (or recently repaired) dockage tester have been performed, adjust the camshaft speed, feed rate, and air control.

- (1) Adjusting the Camshaft Speed. The procedure for adjusting the camshaft speed of rice dockage testers is the same as the procedure used to adjust the camshaft speed of grain dockage testers. See Chapter 4, "Dockage Testers," for step-by-step instructions.

(2) Adjusting the Feed Rate.

- (a) Adjust the feed rate so a sample of long grain rough rice will clear the feed hopper in approximately 90 seconds and clear the bottom sieve in approximately 120 seconds.
- (b) To determine whether the feed rate is correct, prepare a test sample of long grain rough rice consisting of 980 grams of dockage-free long grain rough rice and 20 grams of dockage.
- (c) Set the feed rate to No. 6 and turn the dockage tester on. Then, pour the sample into the hopper while simultaneously starting a stopwatch. Stop the watch when the sample clears the hopper and note the time.
 - 1) If the sample clears the hopper in less than 88 seconds, retard the feed-control knob (move slightly toward the "0" position).
 - 2) If the sample clears the hopper in more than 92 seconds, advance the feed-control knob.
 - 3) Recheck the feed rate and readjust, if necessary.
 - 4) When the correct feed setting has been determined, mark the final setting on the dockage tester.

(3) Adjusting the Air Control Operation.

- (a) Air-Control Knob. Determine that the air-control knob is tight on the shaft and does not have a tendency to slip when the knob is turned from one position to another. If the knob rocks on the shaft, the setscrew has probably worn a groove in the shaft. Before any air adjustment is made, correct the knob slippage problem by either:
 - 1) Turning the shaft to a new position;

- 2) Reversing the ends of the shaft; or
 - 3) Installing a new shaft.
- (b) Air-Control Valve. Determine whether the air-control valve is completely closed when the air-control knob is in the extreme clockwise position. The position of the air-control valve can be checked by exerting counterclockwise pressure on the air valve arm with the fingers.
- 1) If the check shows the air-control valve is closed when the control knob is in the No. 1 position, the air-control valve is adjusted. However, if the check shows that the air-control valve is not completely closed, or if the air-control valve is closed before the indicator reaches the No. 1 position, adjust the air-control valve.
 - 2) When adjusting the air-control valve, keep in mind that a slight discrepancy in the adjustment of the air-control valve significantly affects the amount of material removed. Therefore, all settings must be accurate.
- (c) Adjusting the Air Control. The procedure for adjusting the air control of rice dockage testers is the same as the procedure used to adjust the air control of grain dockage testers. See Chapter 4, "Dockage Testers," for step-by-step instructions.
- c. Dockage Tester Repairs. See Chapter 4, "Dockage Testers."

4. RICE SHELLERS

- a. Maintenance and Alignment.
- (1) General.
 - (a) Maintain rice shellers in good operating condition. Check and adjust them prior to initial use (new or rebuilt) and periodically thereafter.
 - (b) Older shellers have a motor mounted on the top and a direct drive aspirator fan. Newer shellers have the motor mounted on

a wood platform and a belt driven aspirator fan. Both variations are approved.

(c) The rice sheller has three basic parts:

- 1) A steel shelling roll that rotates in a clockwise direction at approximately 1500 rpm;
- 2) A soft roll that rotates in a counterclockwise direction at approximately 90 rpm; and
- 3) An aspirator assembly. The steel and soft rolls rake the hulls from the rice kernel as they pass between them, and then the aspirator discharges the hulls.

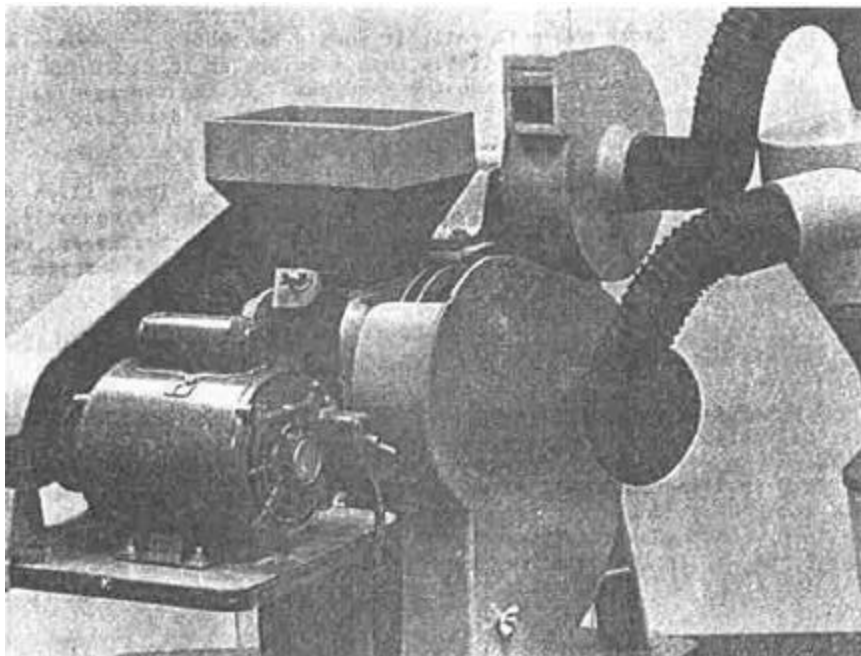


Figure 1, McGill Rice Sheller

- (2) Power Cord. Inspect for wear.

- (3) Placement. Install the rice sheller so that all sides of the machine are accessible to the operator. Mount the device on a solid, level base that is convenient to an electrical outlet.
- (4) Lighting. Ensure that the lighting is sufficient for easy reading of the main roll clearance dial and for visual examination of the sample.
- (5) Steel Shelling Roll. Check the sharpness of the steel shelling roll blades. An excessive amount of paddy kernels remaining in the machine is an indication of dull or worn blades. If the blades are dull, reverse or replace the steel shelling roll.
- (6) Soft Roll. Check the soft roll; it should be smooth and square with the steel shelling roll. When available, use a Durometer to determine the firmness of the soft roll and average the readings. If the average reading is not within the 48 to 52 range, replace the soft roll.
- (7) Leather Flaps. Check the leather flaps for holes. These flaps act to brake the high velocity flow of rice into the aspirator leg. Frequently, the flap closest to the steel shelling roll, which receives the most wear, will develop holes. If any holes are visible, replace the flap.
- (8) Soft Roll Seal. Adjust the soft roll seal so it fits snugly against the soft roll without heavy pressure on the roll surface. The soft roll seal prevents the rice kernels from adhering to the soft roll and guides the shelled kernels to the aspirator leg and machine discharge. See page 6-12 for instructions for adjusting the soft roll seal.
- (9) Cork Shelling Roll Seal. Inspect the cork seal. The seal prevents rice and rice hulls from escaping out the front of the machine. Position the seal so that when the spacing between the steel shelling roll and soft roll is between 12 and 15, as indicated on the roll clearance dial, the seal is just touching the steel roll.
- (10) Air Hose and Connections. Ensure that the air hose connections between the main side casting and hull collector are tight, and that the hose is free of obstructions, holes, and cracks. Wrap the hose ends with plastic tape to provide a tight fit when the ends become worn.
- (11) Lubrication. Lubricate all moving parts with a light machine oil (No. 20). Most machine bearings are of the oil impregnated type requiring very little lubrication. Use caution so that oil does not reach the soft

roll; wipe off surplus oil immediately. Ball bearing type motors do not require service.

- (a) Oil sleeve bearing motors at 6-month intervals with a light machine oil.
 - (b) Note, some steel shelling rolls are fitted with sealed ball bearings which do not require lubrication; some have grease fittings which must be filled periodically.
- b. Rice Sheller Adjustments. After the maintenance and alignment checks on a new (or recently repaired) rice sheller have been performed, adjust the sheller's steel and soft rolls, feed control, and aspirator.
- (1) Adjusting the Steel and Soft Rolls.
 - (a) The clearance or spacing between the steel shelling roll and the soft roll determines the degree of shelling. Too much clearance will provide under-shelled rice. Too little clearance will cause breakage of the rice, quickly dull the steel shelling roll blades, and also cause the soft roll to wear rapidly. Clearance between the rolls is controlled by the main roll clearance screw and dial assembly.
 - (b) To ensure the correct spacing between the rolls for the various types of rice, align the dial and the steel shelling roll. That is, zero the machine. The zero setting is a point at which there is no clearance between the steel shelling roll and the soft roll.
 - (c) Zero the sheller as follows:
 - 1) Remove the cork seal.
 - 2) With the machine running, hold a piece of soft chalk against the soft roll and draw a heavy chalk line on the roll.

- 3) Lower the steel shelling roll by turning the main roll clearance screw counterclockwise until the chalk line starts to fade. Disregard the shrill noise caused by the two rolls reaching close contact while zeroing the machine.
- 4) Fading of the chalk on the soft roll indicates little or no clearance between the rolls. The main roll clearance dial should indicate a setting of zero. If not, loosen the main roll clearance dial setscrew and position the dial to the zero indication. Retighten the setscrew.
- 5) Raise the main roll by turning the main roll clearance screw clockwise a few turns. Again, lower the main roll until the chalk line fades. Recheck the dial indication for zero reading. Reinstall the cork seal.

NOTE: The main roll clearance screw has 10 threads per inch providing 0.100-inch travel of the steel shelling roll for each complete revolution of the screw. The main roll clearance dial is calibrated in thousandths of an inch, which provides for a very accurate setting of the spacing between the steel shelling and soft rolls. The recommended settings or roller spacings for the various types of rough rice are listed in the Rice Inspection Handbook.

- (2) Adjusting the Feed Control. The rough rice flow from the hopper to the sheller is controlled by the feed slide and screw assembly. Adjust the feed slide so 450 to 500 grams (approximately 1 pound) of rough rice will pass through the hopper in 1 minute. Offices that handle more than one type of rice may find it advantageous to have a feed slide and screw assembly for each type they usually examine. The assemblies can be easily removed and replaced when changing from one type of rice to another.
- (3) Adjusting the Aspirator.
 - (a) Adjust the rice sheller aspirator to remove as many of the rice hulls as possible from the sample without removing any whole or broken shelled rice kernels.
 - (b) The flow of air through the aspirator is controlled by the aspirator leg and access assembly.

- (c) Moving the aspirator leg toward the rubber roll seal increases the air flow and also the amount of material removed from the shelled rice.

Note: Aspirator assemblies on the new model shellers are more efficient than the aspirators on the original machines. On some new models it has been necessary to install a small baffle in the air exhaust port to regulate the amount of material removed from the shelled rice.

c. Rice Sheller Repairs and Modifications.

CAUTION: Disconnect the power prior to performing any repairs or modifications.

(1) Soft Roll Replacement.

- (a) Remove the safety guard from the back of the sheller.
- (b) Remove the double pulley V-belt and double pulleys (D-16 and D-18) (Figure 3).
- (c) Loosen the setscrew holding the 9-inch pulley (D-13) to the 3/4-inch shaft (D-14) and remove the pulley.
- (d) The soft roll (C-9) (Figure 2) is secured to the 3/4-inch shaft (D-14) by a locking screw. Rotate the soft roll until the locking screw is visible through the main side casting (D-5) inspection port. Loosen the setscrew and remove the 3/4-inch shaft through the operating side of the machine. The soft roll will drop down and then can be removed from the hopper end of the machine.
- (e) Insert the new roll, replace the 3/4-inch shaft, and center the soft roll between the main side castings. Align the flat milled section of the 3/4-inch shaft under the soft roll locking screw; tighten the locking screw.
- (f) Replace the 9-inch pulley. Align the pulley setscrew with the flat end of shaft and tighten the setscrew. Replace the double pulley and the V-belt. Tighten the double pulley setscrew. Adjust the V-belt tension by turning the king pin (C-5) with the 1/4-inch pin wrench.

- (2) Removing, Reversing, or Replacing the Steel Shelling Roll (C-28).
- (a) Remove the safety guard from the back of the sheller.
 - (b) Raise the steel shelling roll housing with the lifting handle (C-24). Remove the screw(s) from the side of the hopper (C-1) facing the operating side of the machine. Remove the hopper and feed control assembly (C-2 and C-3).
 - (c) Remove the V-belt from the motor pulley and the V-belt pulley (D-19). Belt tension on original model shellers is reduced by loosening the motor mounting bolts and sliding the motor toward the hopper. On new model shellers, raising the steel shelling roll housing reduces belt tension.
 - (d) Remove the V-belt from the pulleys (D-16 and D-18).
 - (e) Loosen the pulley (D-16 and D-18) setscrews and remove the pulleys.
 - (f) Loosen the feeder check locking nuts and disconnect the feeder check adjusting screws. The checks will drop down clearing the steel shelling roll.
 - (g) Loosen the setscrews in the steel shelling roll bearing collars and remove the collars. A pin wrench inserted into the hole in the collar opposite the setscrews and tapped with a hammer will normally loosen it.
 - (h) Check the steel shelling roll shaft for burrs caused by the bearing collar setscrew. Remove the burrs, if any, with a fine file.
 - (i) Remove the four bolts from each of the steel shelling roll bearings. Remove the bearings and the steel shelling roll. The bearing housing has two small holes in the back side which covers the index pins in the main side castings. The bearing housings are not interchangeable from one side of the machine to the other.

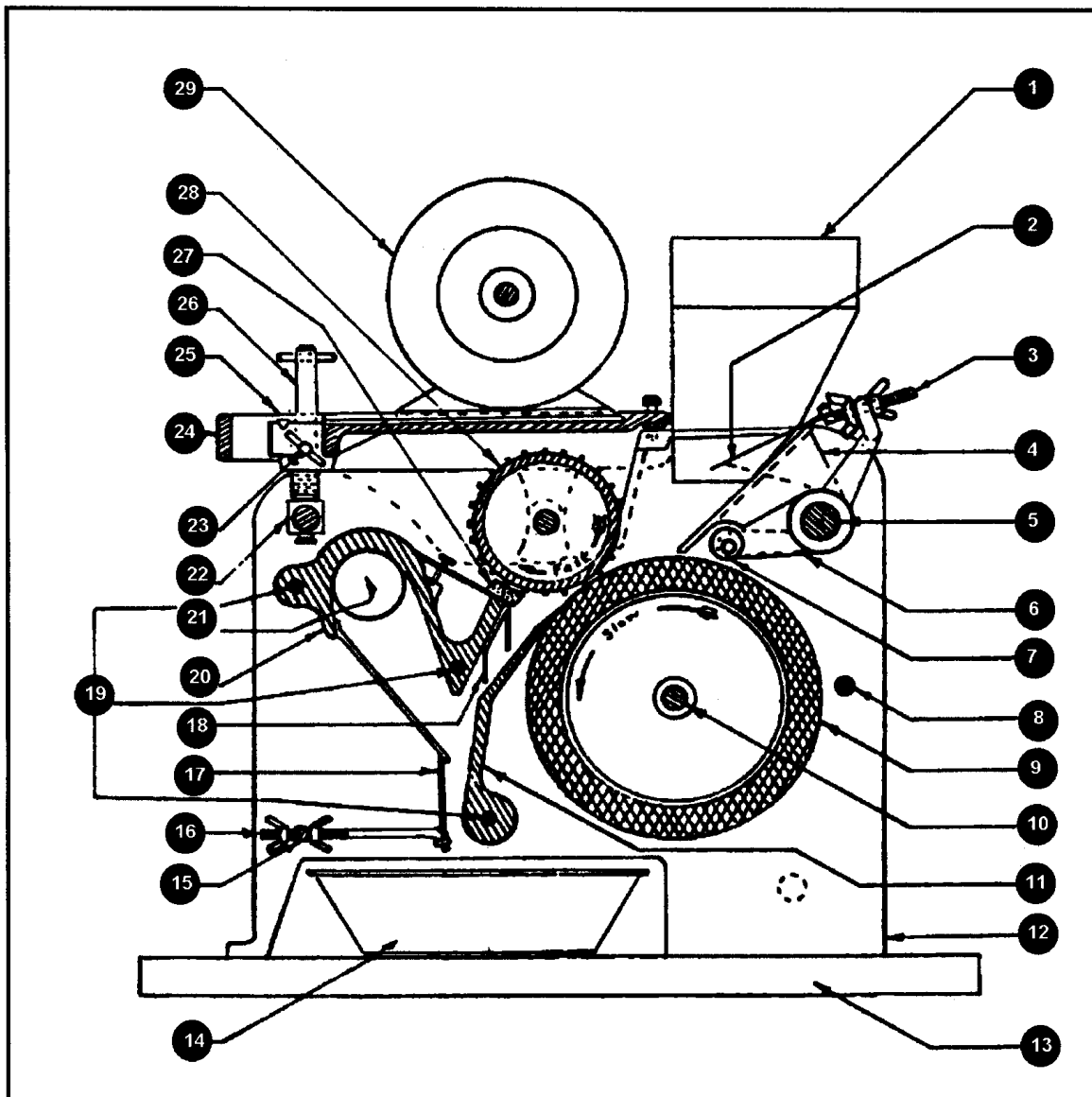
- (j) Start the bearing housing on the new or reversed steel shelling roll shaft and place the steel shelling roll in place. Slide the bearing housing against the main side castings and align the index pins in the holes in the back side of the bearing housings. Replace the bearing bolts and tighten.
- (k) Reposition the feeder checks and connect the feeder check adjustment screws. Adjust the feeder checks to the “nips” of the rolls. Tighten the feeder check locking nuts.
- (l) Center the steel shelling roll so that when the steel shelling roll housing is lowered, the side of the steel shelling roll clears both main castings.
- (m) Replace and tighten the bearing locking collars.
- (n) Replace the V-belt pulleys (D-16 and D-18), replace the V-belt, align the pulleys, and tighten the pulley setscrews.
- (o) Replace the V-belt pulley (D-19), install the V-belt, align the pulley with the motor pulley, and tighten the pulley setscrew. Adjust the V-belt tension by sliding the motor away from the hopper end of machine. Tighten the motor mounting bolts.
- (p) Replace the hopper and hopper feed assembly.
- (q) Replace the safety guard on the back of the machine.
- (3) Removing or Replacing the Aspirator Casting.
 - (a) Raise and lock open the steel shelling roll housing (C-24).
 - (b) Remove the aspirator adjustment holder (C-16).
 - (c) Remove the clamp bolts (C-19) holding the aspirator leg casting (C-20) in position.

- (d) Remove the aspirator leg casting by pushing slightly and then pulling it out of the control end of the machine.
- (4) Replacing or Adjusting the Cork Seal.
 - (a) Raise and lock open the steel shelling roll housing (C-24).
 - (b) Remove the cork seal hold down screw and remove the cork seal.
 - (c) Zero the machine before continuing. Turn the main roll clearance screw clockwise three full revolutions.
 - (d) Insert the new cork seal and tighten the cork seal hold down screw.
 - (e) Gently lower the steel shelling roll housing and rotate the steel shelling roll by hand using the motor V-belt. If the steel shelling roll does not bind on the cork seal, turn the machine on and slowly lower the main roll by turning the main roll clearance screw counterclockwise. The steel roll will cut the cork seal causing a shrill noise.
 - (f) Continue lowering the main shelling roll housing until the main roll clearance screw has been rotated counterclockwise 2-1/2 revolutions.
 - (g) Continue the grinding operation by turning the main roll clearance screw counterclockwise until the dial indicates a reading of 12 to 15.
 - (h) Continue running the machine until the shrill noise stops.
 - (i) Worn cork seals may be shimmed to prolong their life by placing a layer of one or more lengths of masking tape on the underside of the cork seal hold down plate, directly below the cork seal. When following this procedure it is necessary to wear-in the cork seal by the method described above.
- (5) Soft Roll Seal Adjustment.

- (a) Open the aspirator leg (C-17) fully. Loosen the clamp bolt (C-19).
 - (b) Place your hand in the sample discharge port and push the soft roll seal snug against the soft roll.
 - (c) Tighten the clamp bolt and readjust the aspirator.
- (6) Replacing the Leather Flaps.
- (a) Remove the aspirator casting.
 - (b) Remove the cork seal by removing the cork seal hold down screw.
 - (c) Remove the two machine screws that secure the leather flap holding plate.
 - (d) Install the new leather flaps, replace the cork seal, and reinstall the aspirator casting.
- (7) Replacing or Adjusting the Belts.
- (a) Motor Drive V-Belt.
 - 1) Old Model Sheller. Loosen the motor mounting bolts and slide the motor toward the hopper to loosen or remove the V-belt. Slide it away from the hopper to tighten the V-belt. After replacing the belt, retighten the motor mounting bolts.
 - 2) New Model Sheller. Loosen the motor mounting bolts. Lift the motor to loosen or remove the V-belt. Lower the motor to tighten the V-belt. After replacing the belt, retighten the motor mounting bolts.
 - (b) Nine-Inch V-Belt. Loosen the king pin (C-5) setscrews at the main side casting (C-12 and D-5). Turn the king pin with a

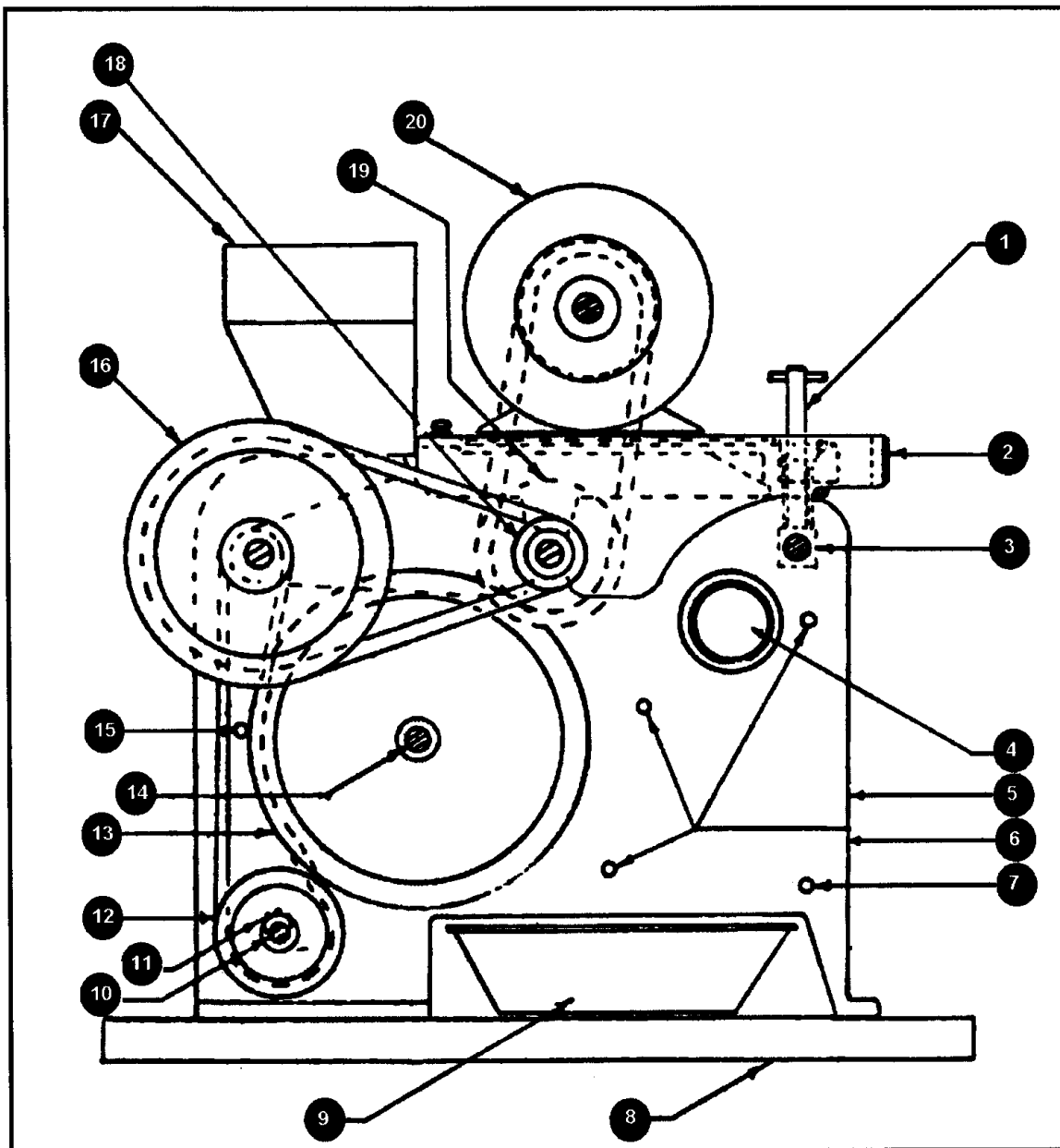
1/4-inch pin wrench to loosen, tighten, or remove the V-belt. After replacing the belt, retighten the king pin setscrews.

- (c) Round Belt 4-Inch Pulley Belt. Loosen the setscrew holding eccentric stub-shaft (D-10). Using the knurled collar (D-11), turn the eccentric stub-shaft to loosen, tighten, or remove the round belt. After replacing the belt, retighten the setscrew.



C-1 Feed Hopper	C-8 Spacer Bar	C-15 Spacer Bar	C-22 Support
C-2 Feed Slide	C-9 Soft Roll	C-16 Asp. Adj. Rod	C-23 Locking Screw
C-3 Feed Screw	C-10 Shaft	C-17 Aspirator Leg	C-24 Lift Handle
C-4 Feed Checks	C-11 Seal	C-18 Leather Flaps	C-25 Main R. Dial
C-5 King Pin	C-12 Main Casting	C-19 Clamp Bolts	C-26 Main R. Screw
C-6 Vibrator Crank	C-13 Base	C-20 Asp. Leg Casting	C-27 Cork Seal
C-7 Knurled Roller	C-14 Pan	C-21 Airport	C-28 Steel Roll
			C-29 1/3 Hp. Motor

Figure 2, McGill Sheller - Front Side



D-1 Adj. Screw	D-6 Clamp Bolt	D-11 Knurled Collar	D-16 Double Pulley
D-2 Lift Handle	D-7 Spacer Bar	D-12 4 in. Pulley	D-17 Feed Hopper
D-3 Support	D-8 Base	D-13 9 in. Pulley	D-18 2 " V-Belt Pulley
D-4 Airport	D-9 Pan	D-14 Soft Roll Shaft	D-19 4 1/2 " Pulley
D-5 Main Casting	D-10 Stub-Shaft	D-15 Spacer Bar	D-20 1/3 Hp. Motor

Figure 3, McGill Sheller - Rear Side

5. RICE MILLERS

- a. Maintenance and Alignment. Maintain rice millers in good operating condition. Check and adjust them prior to initial use and periodically thereafter, as needed. The McGill No. 3 Rice Miller (Figure 4) consists of an electric motor, milling chamber, weight lever and weights, and a timer. The degree to which a sample is milled is determined by the time the rice is agitated in the milling chamber and by the weight applied to the weight lever. Milling times and weights for the various types of rice are found in the Rice Inspection Handbook.
- b. Rice Miller Adjustments.
 - (1) Check the alignment of the screen with the motor shaft using the rice mill alignment gauges (Figure 7). Adjust for proper alignment and tighten the eccentric on both front and rear head plates.
 - (2) Milling pressure force (MPF) is determined by the aggregate of five forces bearing down on the rice during the milling process.

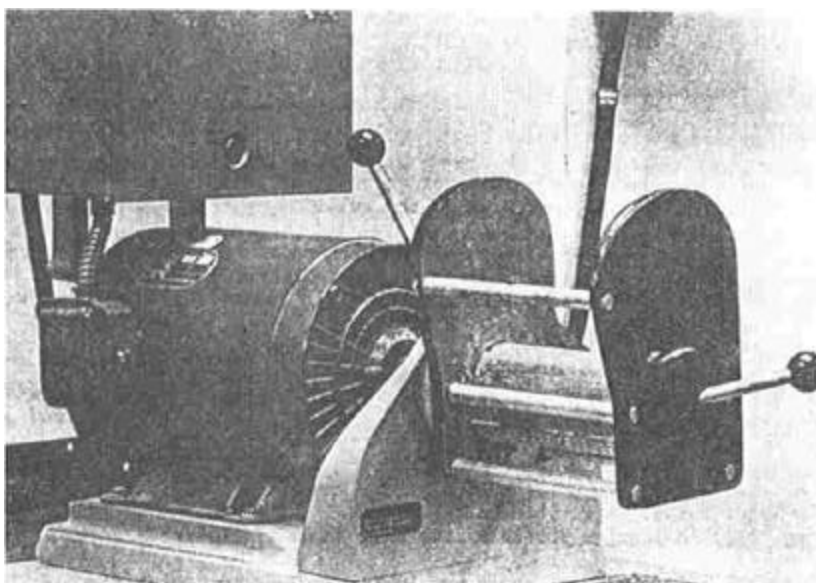
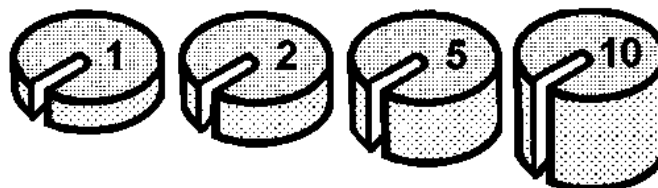
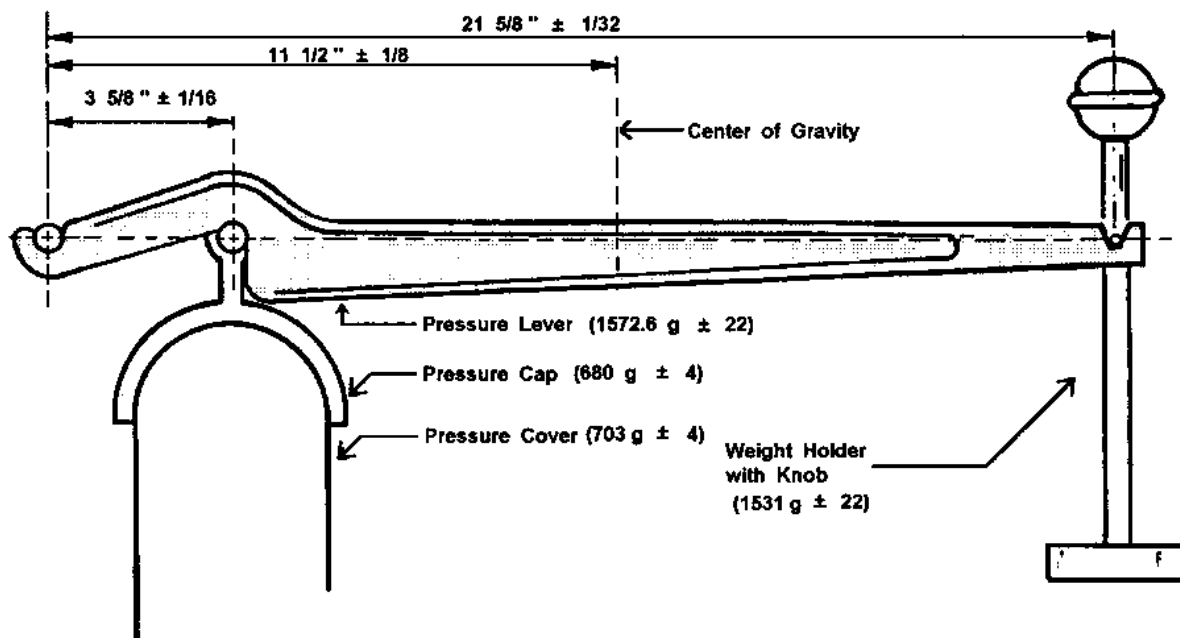


Figure 5, McGill No. 3 Rice Miller



Weight Tolerance ± 2 g

Figure 6, Rice Miller Lever Arm and Weights

The weight lever, holder and mill weights are most critical to milling yield, since their weights are multiplied by a 6 to 1 weight lever factor.

- (a) Check all new parts to ensure that only cast lever arms are used and that related parts are within the specifications.

c. Rice Miller Repairs.

- (1) Timer Control Mechanism and Motor Repairs. Repair of these items shall be made by factory personnel or qualified electric motor repair stations only.
- (2) Milling Chamber Screen Replacement.
 - (a) Remove the hex nuts from the spacer bars on the front-end plate (Figure 7).
 - (b) Remove the front-end plate.
 - (c) Remove the screen and insert the new screen. Insert screens having two breaker bars so that the upper breaker bar is on the left side as the screen is placed in the milling head.
 - (d) Replace the front-end plate; carefully align the screen on the screen locator pins.
 - (e) Replace the nuts on the spacer bars and hand tighten.
 - (f) Place two or three small wooden wedges between the screen and the middle bar, complete the tightening of the spacer bar nuts, and remove wedges. This procedure will provide sufficient space between the screen and the middle spacer bar for the insertion of the pressure cover.
 - (g) Check the alignment of the screen with the motor shaft using the rice mill alignment gauges. Adjust for proper alignment and tighten the eccentric on both front and rear head plates.

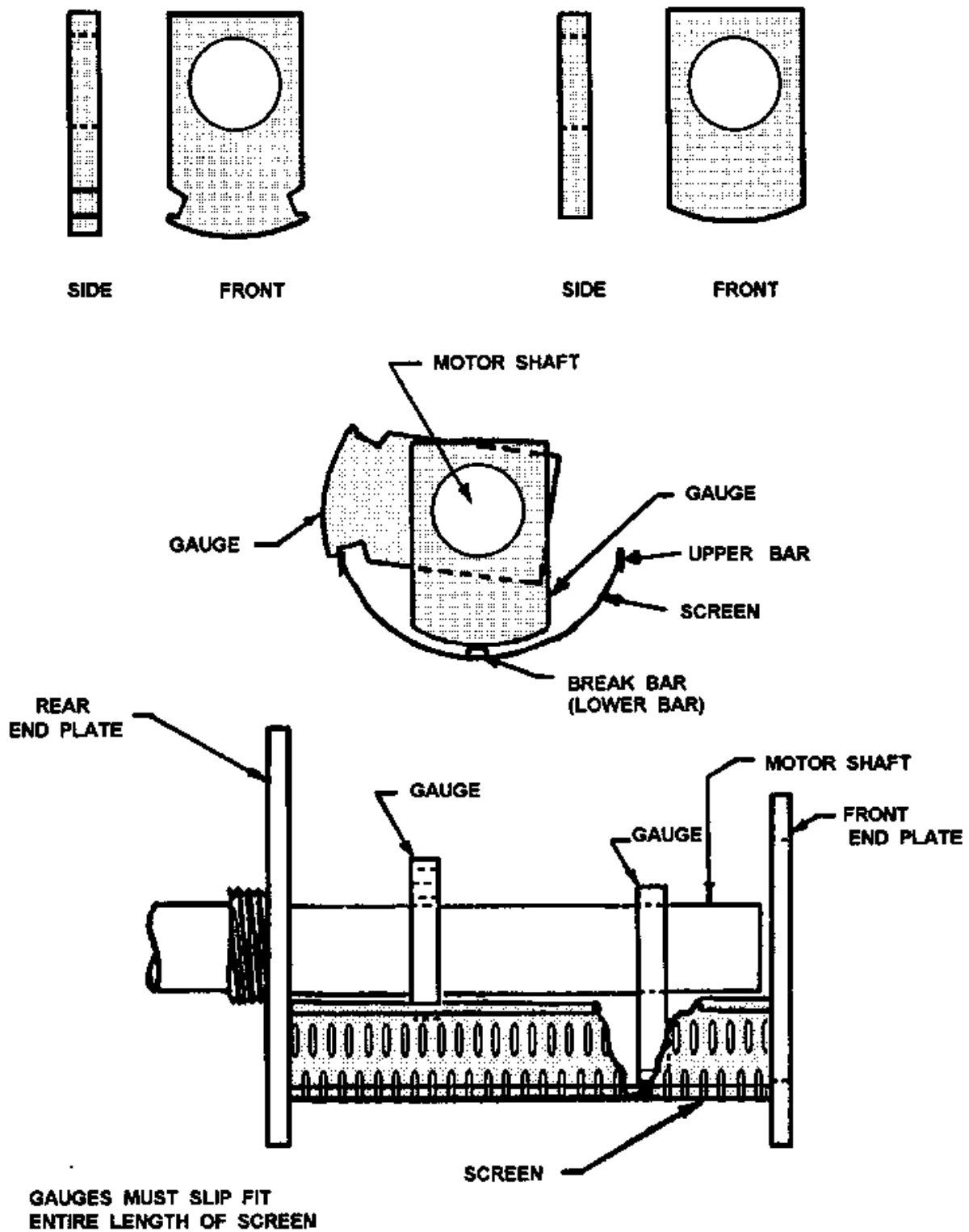


Figure 7, Rice Mill Alignment Gauges

6. TESTING

- a. General. Test each dockage tester, sheller, and miller according to the testing schedule (periodic tests) and whenever the accuracy of the rice equipment is in question, including after all repairs (supplemental tests).
- b. Test Preparations.
 - (1) Initial, Periodic, and Supplemental Tests.
 - (a) The testing office (FGIS Headquarters, in the case of field office Standard equipment, or the field office, in the case of all other equipment) shall prepare test samples of long grain rough rice (or medium grain rough rice if the equipment is to be used in California). Either long grain rough rice or long grain brown rice may be used if only the rice miller is to be tested.
 - (b) A set of three samples shall be provided to each test unit operator for testing the equipment.
 - (c) The testing office shall test the samples using the Headquarters Standard or field office Standard for dockage; next, place them in moisture-proof containers, numbered from one to three; and then, mail them to the appropriate offices for testing. (The testing office shall retain a duplicate set of samples for testing with the Standard rice sheller and rice miller.)
 - (d) Each sample shall be tested in accordance with the test procedures.
- c. Sample Preparation Procedures.
 - (1) Long Grain Rough Rice.
 - (a) Weigh out three, 1,944 gram samples of dockage-free long grain rough rice for each set of equipment that is to be tested.

- (b) Identify the samples as Sample #1, Sample #2, and Sample #3.
 - (c) Divide each sample in half and further identify the halves as either "A" or "B." Keep each set of samples together.
 - (d) To all "A" samples, add the following dockage: air - 8 g, over-the-top - 3 g, over-the-middle - 2 g, and through-the-bottom - 15 g.
 - (e) Do not add dockage to the "B" samples. The "B" samples are the duplicate samples that shall be retained by the testing office for testing with the Standard sheller and miller.
- (2) Medium Grain Rough Rice.
- (a) Weigh out three, 1,928 gram samples of dockage-free medium grain rough rice for each set of equipment that is to be tested.
 - (b) Identify the samples as Sample #1, Sample #2, and Sample #3.
 - (c) Divide each sample in half and further identify the halves as either "A" or "B." Keep each set of samples together.
 - (d) To all "A" samples, add the following dockage: air - 12 g, over-the-top - 4 g, and through-the-bottom - 20 g.
 - (e) Do not add dockage to the "B" samples. The "B" samples are the duplicate samples that shall be retained by the testing office for testing with the Standard sheller and miller.
- (3) Long Grain Brown Rice.
- (a) Weigh out six, 750 gram samples of long grain brown rice for each rice miller that is to be tested.
 - (b) Identify the samples as Sample #1-A, Sample #2-A, Sample #3-A, Sample #1-B, Sample #2-B, and Sample #3-B.
 - (c) Send the "A" samples to the offices whose millers are to be tested; retain the "B" samples for testing with the Standard miller.

d. Test Procedures.

(1) Rice Dockage Tester.

- (a) Thoroughly clean the dockage tester. Insert the appropriate sieves, set the air and feed controls to the proper positions, turn off or remove the sieve cleaner, and ensure that the sieve carriage bumper is properly adjusted; i.e., the rice travels down the center of the bottom sieve.
- (b) Empty the first sample into a hand sieve bottom pan and mix it thoroughly. The light air dockage may tend to cling to the container; make an extra effort to retain all components of the sample. (Do not weigh the samples. Calculations shall be based on 1,000 grams.)
- (c) Turn the tester on and pour the sample into the hopper.
- (d) While pouring the sample into the hopper, activate a stopwatch. After the sample has cleared the hopper, note the time that has elapsed and record it on form FGIS-925, "Rice Checktest Form," page 6-28. After the sample has cleared the bottom sieve, stop the stopwatch and record the total time that has elapsed on form FGIS-925. While the dockage tester is still running, lightly tap the sieves so that all material is expelled.
- (e) Turn the machine off.
- (f) After the machine has stopped, clean the sieves and place the material that was lodged in them into the appropriate separation pan. Handpick the lodged paddy kernels from the top and middle sieve separations and place them with the dockage-free sample; add lodged seeds and other grains from the top and middle sieves to the corresponding dockage separation.
- (g) Pour the air, over-the-top, over-the-middle, and through-the-bottom sieve separations, as applicable, into individual pans.

- (h) Weigh each separation to 0.01 gram and record the results on the form FGIS-925.
 - (i) Place each separation into individual envelopes identified by sample number and type of separation; identify the dockage-free sample and place it aside. (Testing offices should return the separations to the dockage-free sample and mail the sample to the field office or agency for testing.)
 - (j) Test the second and third samples in the same manner.
- (2) Rice Sheller.
- (a) Thoroughly clean the rice sheller and set the dial to the proper setting. Weigh the dockage-free sample and record its weight on form FGIS-925.
 - (b) Turn the sheller on and pour the sample into the hopper. (Testing offices should use the duplicate dockage-free sample for testing their Standard rice sheller and rice miller.)
 - (c) While pouring the sample into the hopper, activate a stopwatch. After the sample has cleared the hopper, stop the stopwatch and record the total time that has elapsed on the form FGIS-925.
 - (d) After all of the sample has passed through the sheller, turn the sheller off.
 - (e) Tap the aspirator collector all around to loosen the hulls. Remove the hulls from the aspirator collector. If practical, weigh the hulls and record the weight on the form FGIS-925.
 - (f) Weigh the brown rice and record its weight on form FGIS-925.
 - (g) Using an approved divider, cut out a representative portion of about 100 grams from the brown rice sample. Split the 100 grams into a 40-gram portion for determining the percentage of broken kernels, and a 50-gram portion for determining the percentage of paddy kernels. Return the excess rice to the original brown rice sample.

- (h) Using the appropriate portions, determine the percentage of paddy kernels and the percentage of broken kernels.
 - 1) Weigh the portions to 0.01 gram and record the weight on a worksheet.
 - 2) Handpick the portions, weigh the separations to 0.01 gram, and record the weight on a worksheet.
 - 3) Determine the percentages by dividing the weight of each paddy and broken kernel separation by the exact weight of the appropriate portion before handpicking ($\times 100$).

Example: $\frac{1.43 \text{ grams}}{51.65 \text{ grams}} - \text{paddy kernels picked} \times 100 = 2.8 \%$
total portion weight

$\frac{3.53 \text{ grams}}{41.89 \text{ grams}} - \text{broken kernels picked} \times 100 = 8.4 \%$
total portion weight

- (i) Record the percentages of paddy and broken kernels on the form FGIS-925.
 - (j) Recombine the paddy and broken kernel portions with the rest of the brown rice sample.
 - (k) Test the second and third samples in the same manner.
- (3) Rice Miller.
- (a) Set up the miller for testing the type of rice used for the test.
 - (b) Warm the miller by milling 750 grams of milled rice in three consecutive 30-second runs (2-pound weight).
 - (c) Thoroughly clean the miller.

- (d) Place the pressure cover (metal sleeve) over the milling cylinder; insert the long end between the lower bars of the cylinder head and screen.
- (e) Tilt the milling chamber so that the rice will flow uniformly into the milling cylinder. Pour the entire brown rice sample into the milling chamber.
- (f) Close the milling chamber and return it to the milling position. Lock it down securely.
- (g) Set the miller's timer switch for exactly 30 seconds. Position the saddle and weight arm on the milling chamber.
- (h) Attach the weight holder to the lever arm with the prescribed weight on the weight holder.
- (i) Turn the miller on and activate a stopwatch. After the miller stops, stop the stopwatch and record the time elapsed on the form FGIS-925.
- (j) Reset the timer to 30 seconds, remove the weights from the weight holder for the brushing run, and turn the miller on again. Using a stopwatch, determine the time elapsed for the brushing run and record the time on the form FGIS-925.
- (k) After the miller stops, remove the weight holder, weight arm, and saddle. With the chamber in the locked position, thoroughly clean the bran on the outside of the milling chamber before removing the pressure cover. Also clean the hopper beneath the machine of all bran particles before removing the cover.
- (l) Place a metal quart container under the hopper opening. Remove the milled rice from the milling chamber by taking off the metal sleeve. Use caution when removing the milled rice so as little as possible of the bran gets mixed into the sample. After removal of all loose and lodged rice, remove the sample container.
- (m) Thoroughly clean the miller of all bran; use a blunt instrument to clean the cylinder opening, crevices, and screen slots. Allow the sample to cool in an uncapped metal can to room temperature. Then weigh the sample and record the weight on form FGIS-925.

- (n) Determine the total rice percentage by dividing the total weight from the miller by 1,000 (x 100). (If only the miller is being tested, determine the total rice percentage by dividing the total weight from the miller by 750.) Record this percentage on the form FGIS-925.

Example: $\frac{662 \text{ grams} - \text{total weight from miller}}{1000 \text{ grams}} \times 100 = 66.2 \%$

- (o) Determine the percentage of whole kernels by cutting out a representative portion of 40 grams from the milled rice sample with an approved divider. Analyze the sample and weigh the whole kernel separation.
- (p) To determine the whole kernel percentage, divide the whole kernel separation weight by the weight of the portion picked (x 100). Multiply the whole kernels by the decimal yield of the total rice. Record the whole kernel percentage on the form FGIS-925.

Example: Step 1. $\frac{32.10 \text{ grams} - \text{whole kernels}}{41.77 \text{ grams} - \text{total portion weight}} \times 100 = 76.8 \%$

Step 2. $76.8\% (\text{whole kernels}) \times .662 (\text{total rice}) = 50.9\% \text{ whole kernel}$

- (q) Place each separation into an individual envelope identified by sample number and type of separation. Test the second and third samples in the same manner as the first.
- (4) Test Report.
- (a) Return the separations and samples in moisture-proof containers to the testing office. Include a properly completed form FGIS-925.
- (b) Upon receipt of the returned forms and samples, the Standard unit operator shall complete the form by recording the Standard unit's test results and then comparing these results to the test unit's results. If the average variation of the test results are within the allowable deviations, the equipment is acceptable.

- (c) In the case of out-of-tolerance equipment, document on the form FGIS-925 all pertinent facts and actions (including adjustments, retests, and follow up action).
- (d) After evaluating the test results, the original of the completed form FGIS-925 shall be returned to the test unit operator. A copy of the form shall be retained by the testing office.

Reserved

FORM FGIS-925, "RICE CHECKTEST FORM"

FORM ST-2 (2-79)		RICE CHECKTEST FORM				USDA - FGIS		CHECKTEST NUMBER	
DATE	FIELD OFFICE	LOCATION		TYPE OF RICE					
DOCKAGE TEST		TEST UNIT				STANDARD			
		MACHINE SETTING		S/N		MACHINE SETTING		S/N	
		FEED	AIR	TOP	MIDDLE	FEED	AIR	TOP	MIDDLE
		6		7					
		No. 1	No. 2	No. 3	AVG.	No. 1	No. 2	No. 3	AVG.
Sample		8							
Time Thru Hopper									
Time Over Bottom Sieve		9							
Air Separation		10	Grms	Grms	Grms	Grms	Grms	Grms	Grms
Over Top Sieve		11	Grms	Grms	Grms	Grms	16	Grms	Grms
Over Middle Sieve		12	Grms	Grms	Grms	Grms	Grms	Grms	Grms
Thru Bottom Sieve		13	Grms	Grms	Grms	Grms	Grms	Grms	Grms
Total Dockage		14	%	%	%	%	%	%	%
		TEST UNIT OPERATOR				STANDARD OPERATOR			
SHELLER TEST		TEST UNIT				STANDARD			
		MACHINE SETTING		S/N		MACHINE SETTING		S/N	
		FEED	AIR	TOP	MIDDLE	FEED	AIR	TOP	MIDDLE
		17		17					
		No. 1	No. 2	No. 3	AVG.	No. 1	No. 2	No. 3	AVG.
Sample		18	Grms	Grms	Grms	Grms	Grms	Grms	Grms
Weight To Sheller		19	Grms	Grms	Grms	Grms	Grms	Grms	Grms
Time Thru Hopper		20	Grms	Grms	Grms	Grms	Grms	Grms	Grms
Rice Hull Weight		21	Grms	Grms	Grms	Grms	25	Grms	Grms
Brown Rice Weight		22	%	%	%	%	%	%	%
Broken % (40 gm. portion)		23	%	%	%	%	%	%	%
Paddy % (50 gm. portion)		24	%	%	%	%	%	%	%
		TEST UNIT OPERATOR				STANDARD OPERATOR			
MILLER TEST		TEST UNIT				STANDARD			
		MACHINE SETTING		S/N		MACHINE SETTING		S/N	
		FEED	AIR	TOP	MIDDLE	FEED	AIR	TOP	MIDDLE
		26		26					
		No. 1	No. 2	No. 3	AVG.	No. 1	No. 2	No. 3	AVG.
Sample		27	Grms	Grms	Grms	Grms	Grms	Grms	Grms
Weight To Miller		28	Grms	Grms	Grms	Grms	Grms	Grms	Grms
Milling Time		29	Grms	Grms	Grms	Grms	Grms	Grms	Grms
Brushing Time		30	Grms	Grms	Grms	Grms	34	Grms	Grms
Weight From Miller		31	%	%	%	%	%	%	%
Whole Kernel %		32	%	%	%	%	%	%	%
Total Rice %		33	%	%	%	%	%	%	%
		TEST UNIT OPERATOR				STANDARD OPERATOR			
CHECKTEST SUMMARY		TOTAL DOCKAGE		SHELLER BROKENS		SHELLER PADDY		WEIGHT TO MILLER	
		35		36		37		38	
Test Unit Avg.		%		%		%		%	
Standard Avg.		%		%		%		%	
Deviation (MDS)		39		40		41		42	
Allowable Tolerance		± .5%		± 3.0%		± 1.0%		Brown + - 1.5% Rough + - 2.0%	
Within Tolerance		39		40		41		42	
Out Of Tolerance		43		44		45		46	
		SUMMARIZED BY				DATE			
REVIEWERS RECOMMENDATION		43				44			
Servicable		43				44			
Retest		43				44			
Repair		43				44			
		REVIEWED BY				DATE			
		43				44			
		43				44			
		43				44			

INSTRUCTIONS FOR COMPLETING
FORM FGIS-925, "RICE CHECKTEST FORM"

- 1 Date the test samples and form FGIS-925 are mailed to the FGIS field office or agency, as applicable.
- 2 FGIS field office or agency that performed the test, as applicable.
- 3 Location of the field office or agency that performed the test, as applicable.
- 4 LG for long grain or MG for medium grain.
- 5 Test unit's serial number.
- 6 For feed, show exact setting; for air, show exact setting.
- 7 For long grain show, top - 28, middle - 25, bottom - 22; for medium grain show, top - 31, middle - --, bottom - 27.
- 8 Time elapsed for each sample to clear the hopper, shown to the nearest whole second.
- 9 Time elapsed for each sample to clear the bottom sieve, shown to the nearest whole second.
- 10 Weight of the separation that is removed by air, shown to 0.01 gram.
- 11 Weight of the separation that passes over the top sieve, shown to 0.01 gram.
- 12 Weight of the separation that passes over the middle sieve, shown to 0.01 gram.
- 13 Weight of the separation that passes through the bottom sieve, shown to 0.01 gram.
- 14 Total dockage (air, over-the-top, over-the-middle, and through-the-bottom), shown to 0.01 percent.
- 15 Name of the person who performed the test.
- 16 Test information for the Standard dockage tester (see 8 - 15).

- 17 Test unit's serial number.
- 18 Weight of the sample prior to shelling, shown to the nearest gram.
- 19 Time elapsed for each sample to clear the hopper, shown to the nearest whole second.
- 20 Weight of the rice hulls removed from the sample, shown to the nearest gram.
- 21 Weight of the rice sample (brown rice) after shelling, shown to the nearest gram.
- 22 Percentage of broken kernels in a 50-gram portion of the brown rice, shown to 0.1 percent.
- 23 Percentage of paddy kernels in a 50-gram portion of the brown rice, shown to 0.1 percent.
- 24 Name of the person who performed the test.
- 25 Test information for the Standard rice sheller (see 18 - 24).
- 26 Test unit's serial number.
- 27 Weight of the sample prior to milling, shown to the nearest gram.
- 28 Time elapsed for sample to complete the milling run, shown to the nearest whole second.
- 29 Time elapsed for sample to complete the brushing run, shown to the nearest whole second.
- 30 Weight of the rice sample (milled rice) after milling, shown to the nearest gram.
- 31 Percentage of whole kernels in the sample after milling, shown to 0.1 percent.
- 32 Total percentage of rice in the sample after milling, shown to 0.1 percent.
- 33 Name of the person who performed the test.
- 34 Test information for the Standard rice miller (see 27 - 33).
- 35 Test unit's average test results, shown to 0.1 percent.
- 36 Standard unit's average test results, shown to 0.1 percent.
- 37 Test unit's average minus Standard unit's average (see 35 and 36). Show any plus or minus deviation from the Standard, including the appropriate sign.

- 38 Tolerances.
- 39 Indicate the results that are within tolerance.
- 40 Indicate the results that are not within tolerance.
- 41 Name of the person who determined if the test results were in tolerance or not.
- 42 Date the determination was made.
- 43 Indicate the recommended action for each device tested; i.e., if the device was within tolerance and otherwise seems to be acceptable - mark "serviceable," if the device fails the test or appears overly erratic - mark "retest," if the device malfunctions - mark "repair."
- 44 If reviewed, name of the person who reviewed the accuracy of the final determination.
- 45 Date of review.

McGILL NO. 3 RICE MILLER - PARTS LIST

No.	Name	Stock Number	No.	Name	Stock Number
1	Vibro Insulator	5-57-02-075	32	Hex Nut	5-00-44-656
2	Control Panel	5-57-02-010	33	Lock Washer	5-00-50-518
3	Bolt 5/16"	5-00-40-428	34	Inside End Plate	5-57-01-010
4	Bolt 5/16"	5-00-40-430	35	Screen Support	5-57-01-070
5	Timer	5-57-02-060	36	Bolt 1/4"	5-00-40-278
6	Starter	5-57-02-050	37	Lower Screen Bar	5-57-01-020
7	Bolt	5-00-40-838	38	Screen	5-57-01-045
8	Spacer	5-57-02-045	39	Screen Bar Side	5-57-01-060
9	Hex Nut	5-00-44-524	40	Cylinder	5-57-07-015
10	Panel Support	5-57-02-015	41	Shaft Adapter	5-57-07-035
11	Bolt 5/16"	5-00-40-442	42	Shaft Adapter Key	5-57-07-005
12	Stud 5/16"	5-57-02-055	43	Setscrew 3/8"	5-00-49-410
13	Motor 3HP	5-00-23-256	44	Lever Spacer Bar	5-57-01-015
14	Clamp 3/8"	5-57-02-005	45	Pressure Cover	5-57-07-030
15	Greenfield Cable	5-57-07-020	46	Cover Saddle	5-57-05-010
16	Connector	5-57-07-010	47	Saddle Pin	5-57-05-015
17	Bolt 3/8"	5-00-40-462	48	Cover Bushing	5-57-05-005
18	Hex Nut	5-00-44-630	49	Weight Lever	5-57-07-070
19	Washer 3/8"	5-00-50-220	50	Upper Handle	5-57-06-020
20	Motor Mount	5-57-03-005	51	Support Pin	5-57-06-015
21	Plywood Base	5-57-04-010	52	Weight Support	5-57-06-010
22	Bolt 5/16"	5-00-44-000	53	1/2-lb Weight	5-57-07-050
23	Base Strip	5-57-04-005	54	1-lb Weight	5-57-07-055
24	Woodscrew #10	5-00-46-900	55	2-lb Weight	5-57-07-060
25	Hopper	5-57-07-025	56	5-lb Weight	5-57-07-065
26	Plastic Knob	5-57-01-030	57	Stud 4-3/16"	5-57-01-075
27	Stud 7"	5-57-07-045	58	Bolt 1/4"	5-00-40-288
28	Clamp Nut	5-57-07-005	59	End Plug	5-57-01-005
29	Alum. Upright	5-57-03-010	60	Outside End Plug	5-57-01-025
30	Bolt 1/4"	5-00-40-408	61	Locator Pins	5-57-01-065